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Letter

Escape to Learning: Unlocking Formative Assessment in Medical Education with Online Escape Rooms

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Dear Editor,

Online escape rooms are a novel and engaging approach to enhancing medical education and formative assessment. Adapted from traditional escape games, these digital activities foster critical thinking, clinical reasoning, teamwork, and the practical application of theoretical knowledge. By immersing learners in interactive, time-limited challenges, they simulate real-world medical scenarios and encourage active participation.

Aligned with the objectives of formative assessment, online escape rooms provide immediate feedback and help evaluate essential competencies. Tools such as Google Forms and H5P enable educators to design customizable and trackable learning experiences. Their effective implementation requires thoughtful planning, alignment with learning outcomes, and consideration of accessibility.

As a technology-enhanced strategy, online escape rooms complement traditional assessment methods and support deeper learning and skill development.

The rapid evolution of medical education necessitates innovative methods to enhance both teaching and assessment ([1]). However, traditional evaluation methods in medical education often focus heavily on summative assessments, which may not adequately capture students' ongoing learning, clinical reasoning, and teamwork skills. There is a growing need for assessment approaches that provide continuous feedback, foster active engagement, and evaluate practical competencies in real-world contexts ([2], [3]).

One such method is the incorporation of online escape rooms, which offer an engaging and effective means of formative assessment. Escape rooms — traditionally physical puzzles or games where players must solve clues to "escape" within a set time limit — have been adapted for online platforms and have found a unique niche in educational settings, particularly in medical training. These interactive games are designed to promote critical thinking, problem-solving, teamwork, and the application of theoretical knowledge to practical scenarios. Recent studies have highlighted their potential as valuable tools for formative assessment, allowing students to demonstrate their knowledge in a dynamic and engaging environment ([1], [2]). By incorporating medical scenarios into escape room games, students work collaboratively to solve complex medical problems, thereby simulating real-life clinical situations ([3], [4]).

Formative assessment refers to ongoing evaluation that provides continuous feedback and supports student improvement. Its integration into medical education is essential for fostering deeper learning and engagement. Unlike summative assessments that evaluate final outcomes, formative approaches help learners reflect, identify knowledge gaps, and refine skills throughout the learning process ([2], [4]). This is particularly valuable in medical education, where developing clinical competence and decision-making ability is critical ([2], [4], [5]).

Online escape rooms offer a novel strategy for such assessment. These time-bound, challenge-based activities require active participation and collaboration, making students co-creators of their learning rather than passive recipients ([6]). They are especially suited to evaluating key competencies such as diagnostic

reasoning, critical thinking, and teamwork, which involves students working effectively and cooperatively on group tasks. By simulating clinical scenarios through problem-solving, students apply theoretical knowledge in a practical, immersive format (2, 5, 7).

The use of online platforms significantly expands the scope of these tools. Google Forms (a survey and quiz creation tool by Google), H5P (an open-source platform for creating interactive HTML5 content), and Breakout EDU (an educational platform that adapts escape room games for classroom use) offer customizable templates to design engaging, scenario-based experiences (8, 9). These tools allow educators to build puzzles and case studies that simulate conditions, diagnostics, and treatment decision-making while providing real-time feedback — immediate, individualized responses to student actions that guide improvement (2, 6, 8).

This adaptability supports diverse learning needs and enhances digital formative assessment. However, designing effective escape rooms requires alignment with core educational objectives, such as assessing clinical knowledge, communication, and collaboration (5, 8, 10). Platforms should also facilitate teamwork by enabling smooth group interaction, which is vital to the escape room format. This makes them particularly effective for evaluating soft skills like cooperation and verbal communication, which are often difficult to measure through traditional exams (10, 11).

Immediate feedback, a cornerstone of effective formative practices, helps students recognize strengths, identify weaknesses, and address knowledge gaps in a supportive, low-stakes environment. It reinforces the idea that learning is a continuous process rather than a final judgment at the end of a course (11, 12). However, success depends on thoughtful design, including considerations of accessibility and inclusivity, to ensure all students can participate regardless of technical access or ability (2, 9, 12). Pilot testing is essential to evaluate functionality, gather feedback, and implement necessary refinements (13).

By incorporating online escape rooms into medical curricula, educators can adopt a more dynamic and engaging assessment model (2, 5, 7). This aligns with modern trends in competency-based assessment, encouraging the use of interactive, technology-integrated tools that go beyond traditional methods.

Such innovations support efforts to enhance — or even revise — legacy approaches like Objective Structured Clinical Examinations (OSCEs), offering richer and more meaningful evaluations through interactive experiences (12-15). Additionally, the role of educational technologies and learning engineering has gained attention in reshaping future medical training practices (16). The relationship between personality traits and learning strategies further underscores the value of adaptive and interactive tools like escape rooms in addressing diverse learner needs.

Footnotes

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